

## ABSTRACT

A novel optical time division multiplexing (OTDM) module based on hybrid-integrated optical chips is disclosed. An integrated modulator chip generates optical RZ signal streams which are then interleaved in an integrated time-delay chip to produce an OTDM signal. The integrated modulator chip is coupled and secured to the integrated time-delay chip via a suitable optical index-matching layer or collimating lenses. Such an approach alleviates the stability problems offered by conventional fiber-based OTDM technology and aids in reducing the size and complexity as well as lowering the cost for the assembly. Furthermore, the time-delay chip of the present invention offers fine tuning capabilities thereby allowing for slight adjustments in the interleaving of optical signal streams when non-standard data transmission rates are required.